

10. (Amended) A work form-measuring apparatus as claimed in claim 9, wherein said coordinate-measuring means leaves a refuge position after having received a signal of informing a change movement completion, from said machining tool, and said changer starts moving said work after having received a signal of informing a coordinate-measuring means refuge completion.

A marked-up copy of the amended claims is enclosed as required by 37 C.F.R. § 1.121.

REMARKS

Claims 1-12 are pending. The above amendments and the following remarks are fully and completely responsive to the Office Action dated May 22, 2002. By this amendment, claims 1-3, 5 and 7-10 have been amended to or more clearly claim the invention. It is submitted that these amendments do not narrow the scope of the claims. No new matter has been entered. Accordingly, claims 1-12 are presented for reconsideration.

Rejections under 35 U.S.C. § 102(b)

Claims 1-4 were rejected under 35 U.S.C. § 102(b) as being anticipated by Yoshida (U.S. Patent No. 4,473,883). In making this rejection, the Office Action took the position that Yoshida discloses all the elements of the claimed invention. However, Applicants submit that claims 1-4 recite subject matter that is neither taught nor suggested by the prior art.

Claim 1 recites a work form-measuring method. The method includes the steps of placing a work on a waiting position of an auto pallet changer directly after the work is machined by a machining tool. The method further includes bringing a probe of a

coordinate-measuring machine close to the work in the waiting position of the auto pallet changer, and then measuring the forms and dimensions of the work while simultaneously machining another work with the machine tool. The coordinate-measuring machine is arranged in the vicinity of the machining tool.

The Office Action took the position that Yoshida discloses all the elements of the claimed invention. However, it is respectfully submitted that the prior art fails to disclose or suggest the claimed invention, and therefore, fails to provide the steps, the structure, and the advantages that are provided by the present invention. For example, the present invention provides for placing a work on a waiting position of an auto pallet changer directly after the work is machined by a machining tool. Thereafter, a probe is brought of a coordinate-measuring machine close to the work in the waiting position of the auto pallet changer and then the forms and dimensions of the work are measured. The coordinate-measuring machine is arranged in the vicinity of the machining tool. This provides a work form measuring method and device which are capable of shortening the production line, including the measurement, as discussed generally in Applicants' specification.

Yoshida appears to disclose a machining system and control system therefore. This system includes a pallet magazine 11 on which a plurality of pallets PA are carried, with each pallet PA being carried on a pallet table. Located near the pallet magazine 11 are one or more pallet changers APC1 and APC2, associated with a respective machining center MT1 and MT2. Also shown near pallet magazine 11 is pallet changer APC4 which serves measuring unit MUNT (as shown in Fig. 14). Yoshida teaches using a coordinate-measuring machine MUNT to measure the work in a waiting

position of an auto pallet changer APC4 and then measuring the form and dimension of the work.

Specifically, it was asserted that Figure 14 of Yoshida discloses placing a work on a waiting position of an auto pallet changer (APC4) corresponding to the pallet changer position at the inlet of a coordinate measuring machine (MUNT) directly after said work is machined by a machining tool (MT1) and bringing the probe of said coordinate-measuring machine (MUNT) close to said work in said waiting position of said auto pallet changer and then measuring the forms and dimensions of said work, said coordinate-measuring machine being in the vicinity of said machine tool.

However, although Yoshida discloses measuring a work at a waiting position of an APC, Yoshida fails to disclose or suggest measuring the work at a waiting position of an APC directly after machining, as recited by claim 1. Yoshida also fails to disclose or suggest the step of moving said probe of said coordinate-measuring machine and said machining tool toward said work in the same direction of motion, as recited in claim 2. Furthermore, Yoshida fails to disclose or suggest the step of moving said tool of said machining tool and said probe of said coordinate-measuring machine to said work in a horizontal direction of motion, as recited in claim 3.

Therefore, Applicants respectfully request that the rejection be withdrawn.

Claim 12 was rejected under 35 U.S.C. § 102(b) as being anticipated by Yoshida et al. (U.S. Patent No. 4,473,883, "Yoshida"). Applicants submit that claim 12 recites subject matter which is neither disclosed nor suggested in the prior art.

Claim 12 recites a coordinate-measuring machine, disposed in the vicinity of a machining tool, for getting a probe thereof close to a work in a waiting position of an

auto pallet changer, directly after said work is machined by said machining tool and placed on said waiting position, to thereby measure the forms and dimensions of said work.

The Office Action referred to Figure 14 for teaching a coordinate-measuring machine [MUNT] disposed in the vicinity of a machining tool [MT1]. The Office Action asserted that the coordinate-measuring machine [MUNT] inherently includes a probe. Additionally, the Office Action asserted that with respect to the limitation “for bringing a probe thereof close to a work in a waiting position of an auto pallet changer of said machining tool, having been machined by said machining tool, placed on said waiting position, to thereby measure the forms and dimensions of said work,” was insufficient to patentably distinguish the prior art from the claimed invention because the claim fails to set forth structural limitations of the coordinate-measuring machine and because the limitation is directed to a manner in which the coordinate-measuring machine is to be used, these claim limitations are intended use and do not differentiate the claimed apparatus from the prior art. However, Applicants respectfully disagree. Claim 12 positively recites that there is a coordinate-measuring machine, disposed in the vicinity of a machining tool, for getting a probe thereof close to a work in a waiting position of an auto pallet changer, directly after said work is machined by said machining tool and placed on said waiting position, to thereby measure the forms and dimensions of said work. This is a clear structural relationship.

According to MPEP § 2173.05(g), functional limitations must be considered, the same as any other limitation of a claim, and evaluated for what it conveys to a person of ordinary skill in the art. The recitations cited by the Office Action serve to precisely

Claim is not directed to the assembly if solved by forming.
define the structural attributes of interrelated component parts of the claimed assembly.

Therefore, because Yoshida fails to disclose or suggest the claimed invention,

Applicants respectfully request that the rejection be withdrawn.

Claims 5-11 were rejected under 35 U.S.C. § 102(b) as being anticipated by Yoshida.

Claim 5 recites a work form-measuring means including an auto pallet changer for moving a work between a waiting position and a machining position at an inlet of a machining tool. A coordinate-measuring means brings a probe thereof close to the work in the waiting position of the auto pallet changer directly after the work is machined by the machining tool and placed on the waiting position, to thereby measure the forms and dimensions of the work.

The Office Action has now taken the position that Yoshida discloses a work form measuring apparatus in Figure 14, comprising an auto pallet changer (APC4) and a coordinate measuring machine (MUNT), which inherently has a probe. The Office Action further asserted that the limitations "for moving a work between a waiting position and a machining position at an inlet of a machining tool" and "for bringing a probe thereof close to said work in said waiting position of said auto pallet changer, directly after said work is machined by said machining tool and placed on said waiting position, to thereby measure the forms and dimensions of said work," are directed to the manner of operation of the pallet changer and of the coordinate-measuring machine, and they fail to further set forth structural elements of the claimed invention and, hence, are functional statements and fail to differentiate the claimed invention from the prior art.

However, as stated above, with respect to functional limitations, M.P.E.P. § 2173.05(g) states that functional limitations must be considered. Additionally, claims 5-11 are written in means-plus-function language. In reviewing means-plus-function claims, the Examiner is obligated to interpret the claim by the function that it performs, rather than by the specific structure. Therefore, as there is no clear teaching in Yoshida of the specific function being claimed for the specific means, Yoshida fails to disclose or suggest the claimed invention because there is no teaching or suggestion of the specific functions being claimed in the means-plus-function clauses.

Furthermore with respect to the refuge means recited in claims 6-8, the Office Action took the position that a coordinate measuring means inherently comprises a refuge means and that the direction of motion in which the measuring means takes refuge is a matter of design choice or engineering skill. However, the Applicants respectfully disagree. In Applicants' specification generally at pages 4, 5, 12 and 13, it is discussed, for example, that the refuge means is adapted to cause the coordinate-measuring machine to take refuge in a linear motion, which requires only simple construction to take refuge or the refuge means is adapted to cause the coordinate-measuring machine to take refuge in a rotational motion, which requires only a small occupation of space to take refuge. Therefore, Applicants' specification demonstrates that this feature has a specific purpose and is not merely design choice. Additionally, the Office Action has failed to provide why it would have been obvious to modify Yoshida by implementing any of the aforementioned design choices.

Furthermore, since claims 6-11 are directly or indirectly dependent on independent claim 5, Applicants submit that each of these claims recite subject matter

that is neither disclosed nor suggested by the prior art, for at least the same reasons set forth with respect to claim 5.

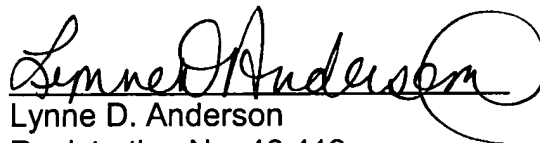
Thus, Yoshida fails to teach disclose or suggest each element of the claimed invention. Therefore, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 5-11 under 35 U.S.C. § 102(b).

CONCLUSION

Applicants submit that the application is now in condition for allowance. If the Examiner believes the application is not in condition for allowance, Applicants respectfully request that the Examiner contact the undersigned attorney by telephone, if it is believed that such contact will expedite the prosecution of the application.

The Commissioner is authorized to charge payment for any additional fees which may be required with respect to this paper to Deposit Account No. 01-2300, **referencing Attorney Docket No. 107292-09003.**

Respectfully submitted,


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Enclosure: Marked-Up Copy of Amended Claims

GEO:LDA/elz:cvj

MARKED-UP COPY OF AMENDED CLAIMS

Please amend claims 1-3, 5 and 7-10 as follows:

1. (Four times Amended) A work form-measuring method comprising the steps of:

placing a work on a waiting position of an auto pallet changer directly after the work is machined by a machining tool; and

bringing a probe of a coordinate-measuring machine close to said work in said waiting position of said auto pallet changer and then measuring the forms and dimensions of said work while simultaneously machining another work with the machine tool, said coordinate-measuring machine being arranged in the vicinity of said machining tool.

2. (Twice Amended) A work form-measuring method as claimed in claim 1, further comprising the step of [wherein the direction of motion of] moving said probe of said coordinate-measuring machine [moving to said work is the same as that of a tool of] and said machining tool [moving to] toward said work in the same direction of motion.

3. (Twice Amended) A work form-measuring method as claimed in claim 2, further comprising the step of [wherein said direction of motion of] moving said tool of said machining tool [moving to said work] and [that of] said probe of said coordinate-measuring machine [moving] to said work [both are] in a horizontal direction of motion.

5. (Four times Amended) A work form-measuring apparatus comprising:
an auto pallet changer means for moving a work between a waiting position and a machining position at an inlet of a machining tool; and

a coordinate-measuring [machine] means for bringing a probe thereof close to said work in said waiting position of said auto pallet changer, directly after said work is machined by said machining tool and placed on said waiting position, to thereby measure the forms and dimensions of said work.

7. (Twice Amended) A work form-measuring apparatus as claimed in claim 6, wherein said refuge means causes said coordinate-measuring [machine] means to take refuge with a linear motion.

8. (Twice Amended) A work form-measuring apparatus as claimed in claim 6, wherein said refuge means causes said coordinate-measuring [machine] means to take refuge with a rotational motion.

9. (Twice Amended) A work form-measuring apparatus as claimed in claim 5, wherein said machining tool and said coordinate-measuring [machine] means mutually exchange a measurement enabling signal and a measurement completion signal, both of which are related to the movement of said work by said changer.

10. (Amended) A work form-measuring apparatus as claimed in claim 9, wherein said coordinate-measuring [machine] means leaves a refuge position after having received a signal of informing a change movement completion, from said machining tool, and said changer starts moving said work after having received a signal of informing a coordinate-measuring [machine] means refuge completion.